# NOTICE OF COMMISSIONING

## 1824-A-NOC-119

MINERA PANAMA
COMMISSIONING IN PROGRESS
PUESTA EN MARCHA EN PROGRESO
The purpose of this TAG is to IDENTIFY EQUIPMENT which is still in the commissioning phase.
El propósito de esta ETIQUETA es para IDENTIFICAR el EQUIPO que está bajo la etapa puesto en marcha.
This equipment must not be operated without the Permission of the Commissioning Manager or Authorised Nominee.
No operar este equipo sin el Permiso del Director de Comisión o del Designado Encargado.
This Tag can only be removed by the Commissioning Manager or Authorised Nominee.
Solo el Director de Comisión o Designado Encargado puede quitar esta Etiqueta.
SEE OTHER SIDE / VER EL REVERSO

**Date: August 06, 2018 – 12:01PM**

**System ID:** 2-717-A/B; 2-810-A/B; 2-811-A/B

**System Description:** Fan ID, FD and PA.

**Contact Name:** Brenton Sherston, Ronald Freiley, Eduardo Garrido

**Contact Number:** 64422720, 69804558, 69786077

**Fecha: 06 de Agosto del 2018 – 12:01 PM**

**ID Sistema:** 2-717-A/B; 2-810-A/B; 2-811-A/B

**Descripción del Sistema:** ID, FD y PA Fans

**Nombre Contacto:** Brenton Sherston, Ronald Freiley, Eduardo Garrido

**Número de Contacto:** 64422720, 69804558, 69786077

**ENGLISH**

Today at 12 noon, we will start the Commissioning and coupling runs of the ID, FD, and PA Fans A and B. Areas around the ID, FD and PA fans, Including the whole draft group gas Perth, GAH's, FGD gas path, furnace entry, all dampers, as well as associated ducts identified with blue commissioning tags and barricade tape will be restricted. Any work on this system or any work requiring entry to the gas path requires approval from the Commissioning Manager PTW and LOTO. See attachments.

**SPANISH**

Hoy 12:01pm , comenzaremos con el comisionamiento y acoplamiento de los ID, FD, PA Fans A y B. Incluyendo todo el proyecto de grupo perth gas, GAH,s, ruta de gas FGD, entrada de horno y todos los amortiguadores.

Las áreas alrededor de los ID, FD and PA fans, al igual que los ductos asociados identificados con la tarjeta azul o que estén dentro del área barricada quedan restringidos.

Cualquier trabajo en este sistema o cualquier trabajo que requiera ingresar a la ruta de gas requiere la aprobación del Gerente de Comisionamiento de PTW y LOTO. Ver adjuntos

**POST ON ALL PACO SAFETY NOTICE BOARDS**

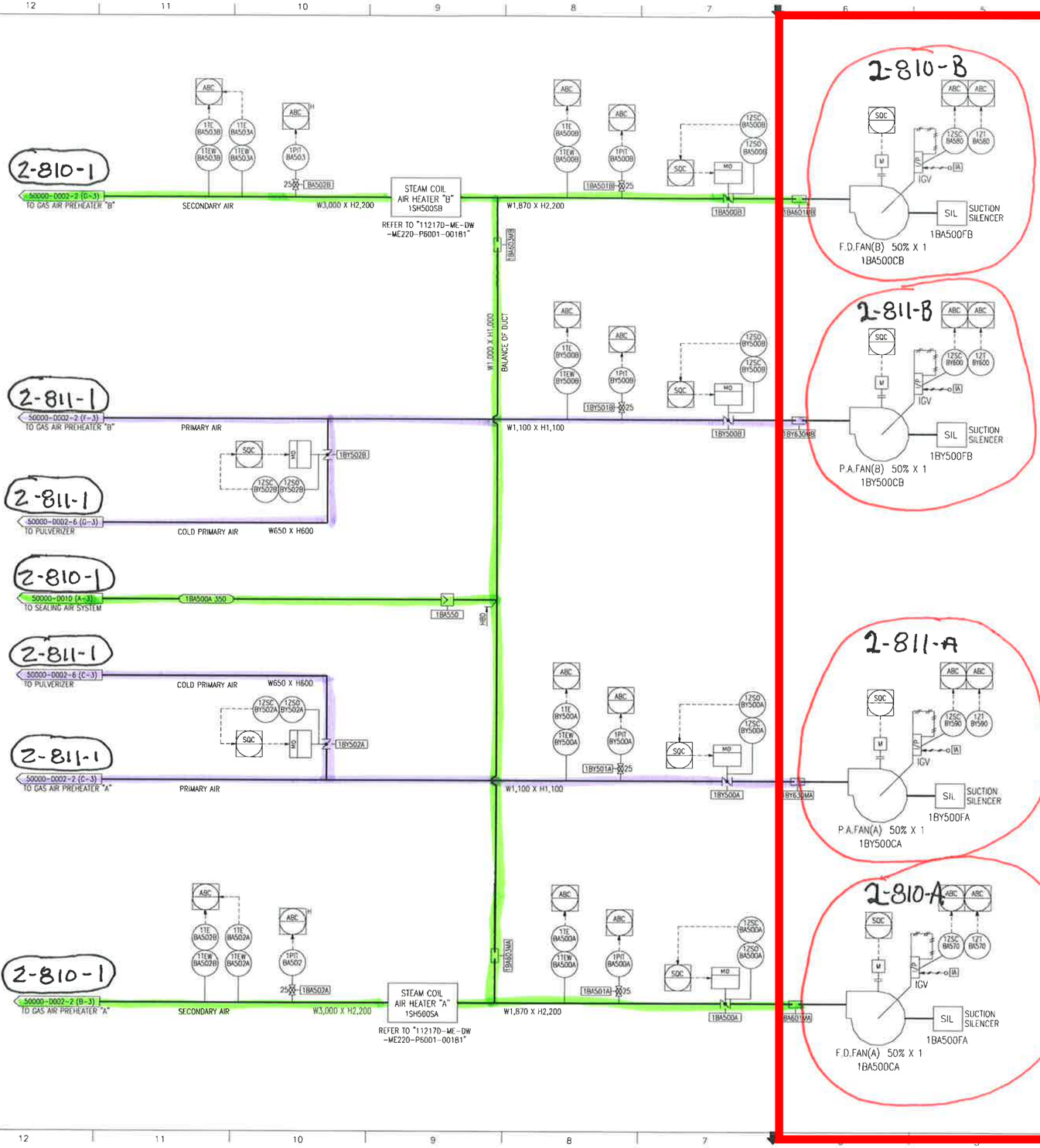
**PACO** MANAGERS & SUPERINTENDENTS TO **ENSURE** THIS **NOC** IS COVERED IN TOOLBOX MEETINGS AND ALL PERSONNEL ARE AWARE OF THE HAZARDS.

Minera Panamá

# PACO
# Motor List

SK E&C Sargent & Lundy

| Motor Tag | Client Tag | Description | Startup Code | Voltage Class |
|---|---|---|---|---|
| 2BA501CA | 2BA501CA | I.D FAN A | 2-717-A | MV |
| 2BA501CB | 2BA501CB | I.D FAN B | 2-717-B | MV |
| 2BY500CA | 2BY500CA | P.A FAN A | 2-811-A | MV |
| 2BY500CB | 2BY500CB | P.A FAN B | 2-811-B | MV |
| 2BA500CA | 2BA500CA | F.D FAN A | 2-810-A | MV |
| 2BA500CA | 2BA500CA | F.D FAN A | 2-810-A | MV |




## TEMP. & VIBRATION MEASURING FOR F.D.FAN & P.A FAN

| DESCRIPTION | FAN BEARING TEMPERATURE | | MOTOR BEARING TEMPERATURE | | MOTOR WINDING TEMP | | | | | | MOTOR BEARING VIBRATION | | FAN BEARING VIBRATION | | | | FAN SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOGIC LOOP | ABC | | ABC | ABC | ABC | | | | | ABC (SPARE) | VMS | VMS | VMS | | VMS | | VMS |
| OF "A" | 1TE BA570A | 1TE BA570B | 1TE BA571A | 1TE BA571B | 1TE BA572A | 1TE BA572B | 1TE BA572C | 1TE BA573A | 1TE BA573B | 1TE BA573C | 1VE BA570A | 1VE BA570B | 1VE BA571A | 1VE BA571B | 1VE BA572A | 1VE BA572B | 1ST BA570 |
| OF "B" | 1TE BA580A | 1TE BA580B | 1TE BA581A | 1TE BA581B | 1TE BA582A | 1TE BA582B | 1TE BA582C | 1TE BA583A | 1TE BA583B | 1TE BA583C | 1VE BA580A | 1VE BA580B | 1VE BA581A | 1VE BA581B | 1VE BA582A | 1VE BA582B | 1ST BA580 |
| AF "A" | 1TE BY590A | 1TE BY590B | 1TE BY591A | 1TE BY591B | 1TE BY592A | 1TE BY592B | 1TE BY592C | 1TE BY593A | 1TE BY593B | 1TE BY593C | 1VE BY590A | 1VE BY590B | 1VE BY591A | 1VE BY591B | 1VE BY592A | 1VE BY592B | 1ST BY590 |
| AF "B" | 1TE BY600A | 1TE BY600B | 1TE BY601A | 1TE BY601B | 1TE BY602A | 1TE BY602B | 1TE BY602C | 1TE BY603A | 1TE BY603B | 1TE BY603C | 1VE BY600A | 1VE BY600B | 1VE BY601A | 1VE BY601B | 1VE BY602A | 1VE BY602B | 1ST BY600 |
| LOCATION | DE | NDE | IB | OB | U | V | W | U | V | W | IB | OB | X | Y | X | Y | DE |
| | | | | | | | | | | | | | DE | | NDE | | |

NOTE

1. MARK: ⋊ MEANS BOILER MAKER SCOPE OF SUPPLY.

2. EQUIPMENT DATA

1BA500CA,B
F.D.FAN

TYPE : CENTRIFUCAL
CAPACITY : 4154.98 $M^3$/MIN
POWER : 510 KW
TOTAL PRESSURE : 495 mmAg
MATERIAL : SS400
SPEED : 1788 RPM

1BY500CA,B
P.A.FAN

TYPE : CENTRIFUCAL
CAPACITY : 1588.72 $M^3$/MIN
POWER : 590 KW
TOTAL PRESSURE : 1335 mmAg
MATERIAL : SS400
SPEED : 1791 RPM

**FOR CONSTRUCTION**

| NO. | DATE | REVISION DESCRIPTION | DRAWN | CHK'D | APP'D |
|---|---|---|---|---|---|
| 0 | '14.06.11 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '14.03.27 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 1 | '13.11.05 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| B | '13.06.21 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '13.02.08 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '12.12.14 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| B | '12.08.31 | FOR APPROVAL | K.H.HA | K.J.LEE | E.R.CHO |
| A | '12.04.30 | FOR APPROVAL | K.H.HA | K.J.LEE | H.D.LEE |

OWNER: Minera Panamá — Minera Panama S.A

CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,

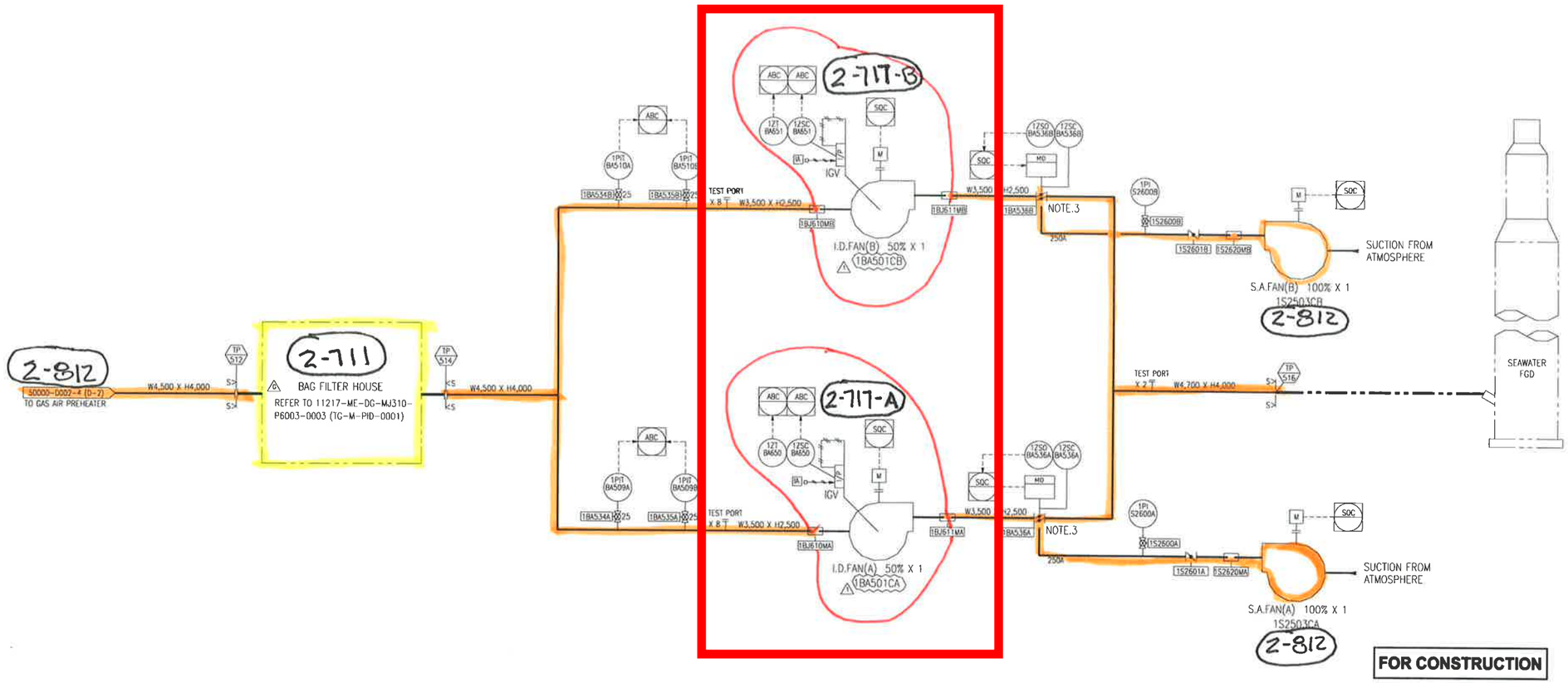
CONTRACTOR'S ENGINEER: Sargent & Lundy

VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

| TITLE | | SCALE |
|---|---|---|
| P & ID OF AIR & GAS SYSTEM (1/7) (PRIMARY AIR & SECONDARY AIR) | | NONE |
| SEENTEC PJT NO. | WORK NAME | SKEC JOB NO. |
| 6F11-1272 | PACO POWER PLANT PROJECT (150MW x 2UNITS) | 11217D |
| CONTRACTOR DOC. NO. | 11217D-ME-DG-ME220-P6001-00088-1 | |

| DRAWN | CHECKED | APPROVED | SEENTEC DOC. NO. | REV. |
|---|---|---|---|---|
| S.J.KIM | K.J.LEE | E.R.CHO | 50000-D002-1 | 0 |
| '14.06.11 | '14.06.11 | '14.06.11 | | |

A3(420x297%)




## TEMP. & VIBRATION MEASURING FOR I.D.FAN

| DESCRIPTION | FAN BEARING TEMPERATURE | | MOTOR BEARING TEMPERATURE | | MOTOR WINDING TEMP. | | | | | | MOTOR BEARING VIBRATION | | FAN BEARING VIBRATION | | | | FAN SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOGIC LOOP | ABC | | ABC | ABC | ABC | | | | | ABC (SPARE) | VMS | VMS | VMS | | VMS | | VMS |
| IDF "A" | 1TE BA610A | 1TE BA610B | 1TE BA611A | 1TE BA611B | 1TE BA612A | 1TE BA612B | 1TE BA612C | 1TE BA613A | 1TE BA613B | 1TE BA613C | 1VE BA610A | 1VE BA610B | 1VE BA611A | 1VE BA611B | 1VE BA612A | 1VE BA612B | 1ST BA610 |
| IDF "B" | 1TE BA620A | 1TE BA620B | 1TE BA621A | 1TE BA621B | 1TE BA622A | 1TE BA622B | 1TE BA622C | 1TE BA623A | 1TE BA623B | 1TE BA623C | 1VE BA620A | 1VE BA620B | 1VE BA621A | 1VE BA621B | 1VE BA622A | 1VE BA622B | 1ST BA620 |
| LOCATION | DE | NDE | IB | OB | U | V | W | U | V | W | IB | OB | X | Y | X | Y | DE |
| | | | | | | | | | | | | | DE | | NDE | | |

NOTE

1. MARK: S>| |<S MEANS BOILER MAKER SCOPE OF SUPPLY
2. SEAL AIR FANS SHALL BE PROVIDED BY DAMPER MAKER. REFER TO DRAWING 11217D-ME-PR-ME220-P6001-0015B (4DPD1-V102)
3. THESE DAMPERS SHALL BE SUPPLIED AS TANDEM DAMPER WITH 1 X 100% SEAL AIR FANS. THE TANDEM ISOLATION DAMPERS SHALL HAVE ESSENTIALLY ZERO LEAKAGE ACROSS CLOSED BLADES FOR ALL LOAD CONDITIONS. LEAKAGE TO ATMOSPHERE SHALL BE ESSENTIALLY NOTHING IN BOTH OPEN AND CLOSED POSITIONS.
4. EQUIPMENT DATA

1BA501CA,B
I.D.FAN
TYPE : CENTRIFUGAL
CAPACITY : 8397.1 M3/MIN
POWER : 2300 KW
TOTAL PRESSURE : 1120 mmAg
MATERIAL : SS400
SPEED : 893 RPM

1S2503CA,B
S.A.FAN
TYPE : CENTRIFUGAL
CAPACITY : 50 M3/MIN
POWER : 11 KW
TOTAL PRESSURE : 630 mmAg
MATERIAL : SS400
SPEED : 3535 RPM

**FOR CONSTRUCTION**

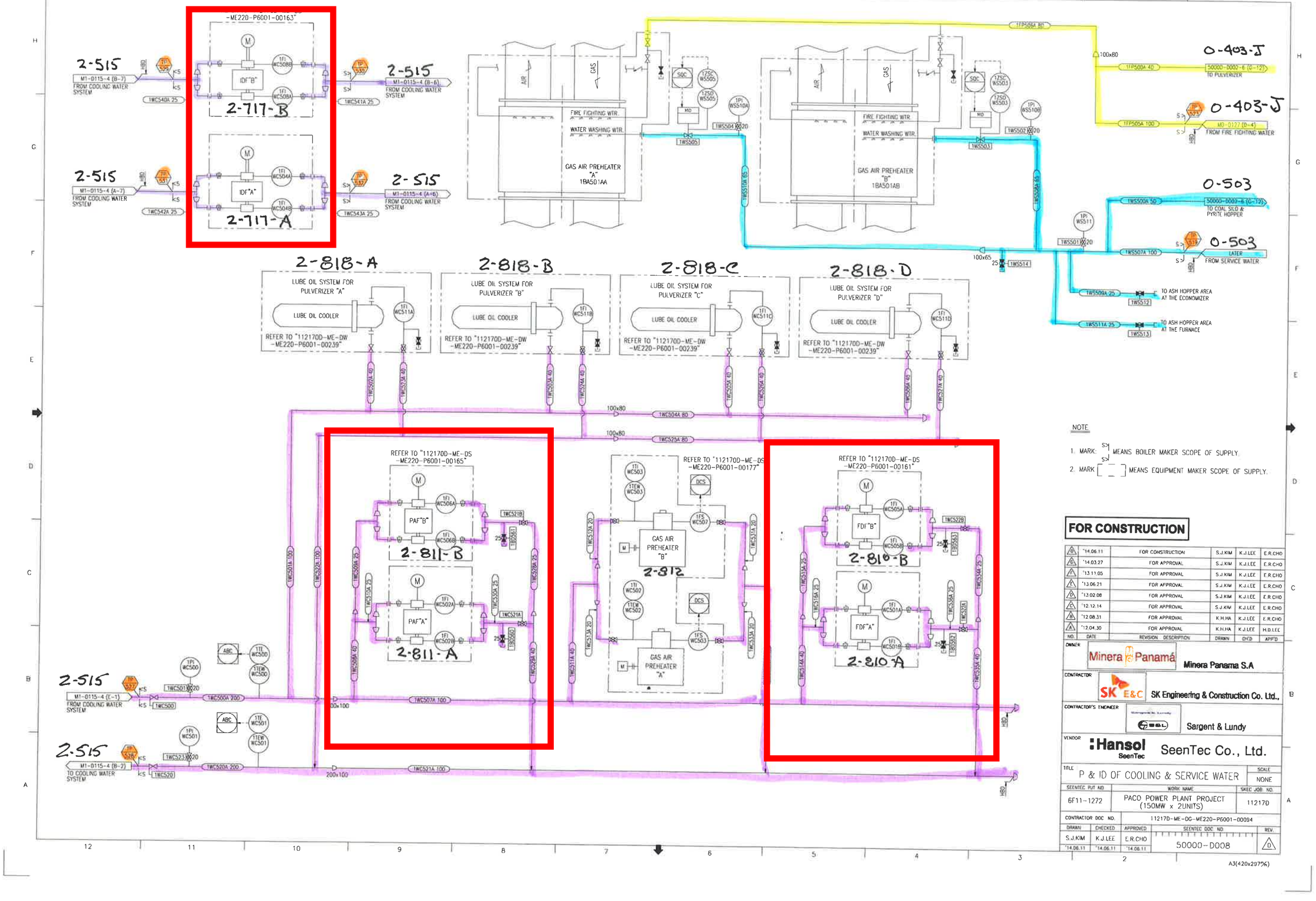
| NO. | DATE | REVISION DESCRIPTION | DRAWN | CHD | APP'D |
|---|---|---|---|---|---|
| 1 | '14.10.31 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '14.06.11 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| 6 | '14.03.27 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 5 | '14.01.22 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 4 | '13.06.21 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 3 | '13.02.08 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 2 | '12.12.14 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 1 | '12.08.31 | FOR APPROVAL | K.H.HA | K.J.LEE | E.R.CHO |
| 0 | '12.04.30 | FOR APPROVAL | K.H.HA | K.J.LEE | H.D.LEE |

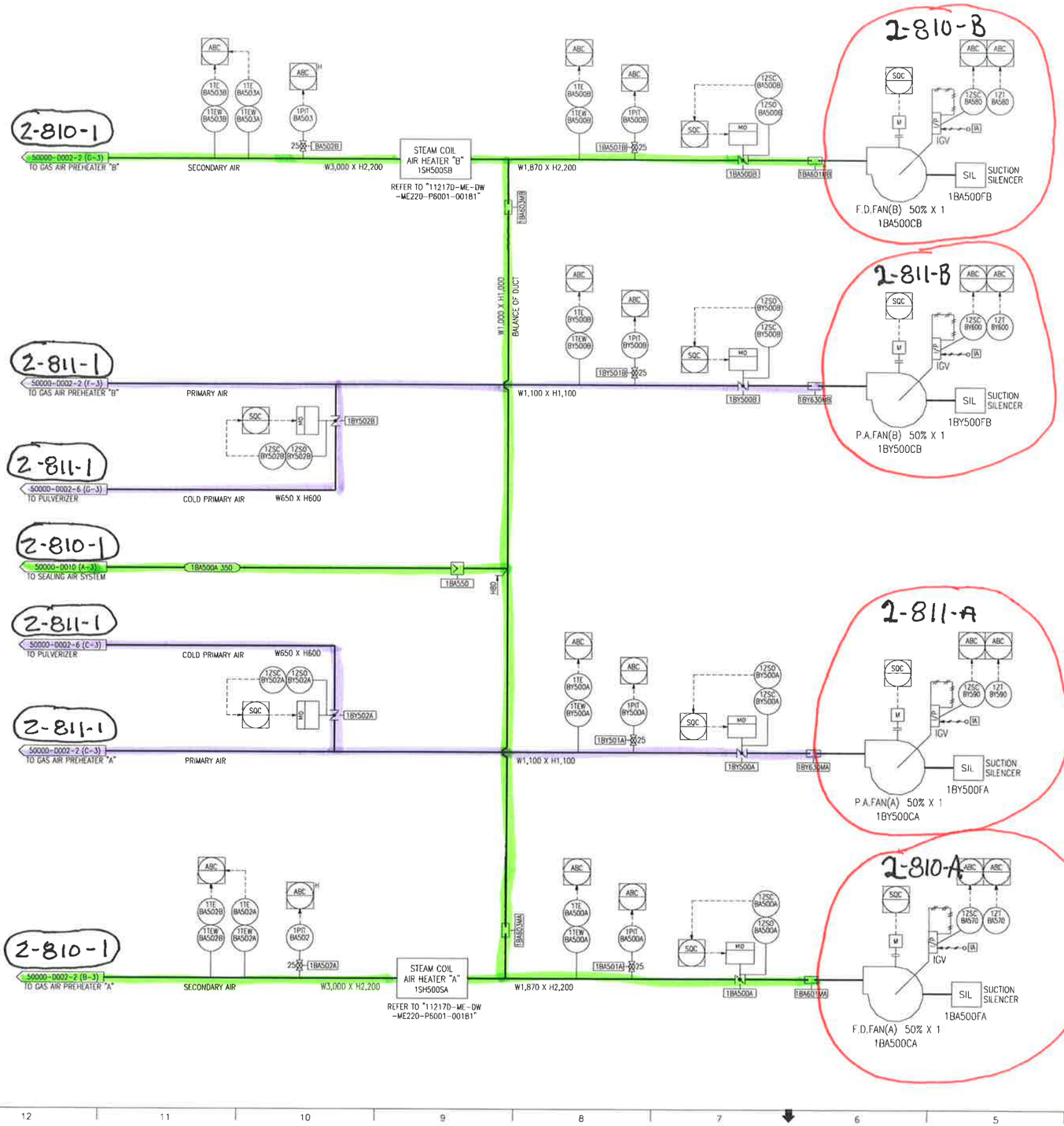
OWNER: Minera Panamá — Minera Panama S.A
CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,
CONTRACTOR'S ENGINEER: S&L — Sargent & Lundy
VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

| | |
|---|---|
| TITLE | P & ID OF AIR & GAS SYSTEM (7/7) (FLUE GAS) |
| SCALE | NONE |
| SEENTEC PJT NO. | 6F11-1272 |
| WORK NAME | PACO POWER PLANT PROJECT (150MW x 2UNITS) |
| SKEC JOB NO. | 11217D |
| CONTRACTOR DOC. NO. | 11217D-ME-DG-ME220-P6001-00088-7 |

| DRAWN | CHECKED | APPROVED | SEENTEC DOC. NO. | REV |
|---|---|---|---|---|
| S.J.KIM '14.10.31 | K.J.LEE '14.10.31 | E.R.CHO '14.10.31 | 50000-D002-7 | 1 |

A3(420x297)


2-515
M1-0115-4 (B-7)
FROM COOLING WATER SYSTEM
1WC540A 25
IDF"B"
2-717-B
1WC541A 25
M1-0115-4 (B-6)
FROM COOLING WATER SYSTEM
2-515
M1-0115-4 (A-7)
FROM COOLING WATER SYSTEM
1WC542A 25
IDF"A"
2-717-A
1WC543A 25
M1-0115-4 (A-6)
FROM COOLING WATER SYSTEM
AIR
GAS
FIRE FIGHTING WTR.
WATER WASHING WTR.
GAS AIR PREHEATER "A" 1BA501AA
GAS AIR PREHEATER "B" 1BA501AB
1WS504 20
1WS505
1WS510A 65
1WS503 20
1WS502
1WS510B 65
1WS501 20
1WS514
100x65
1TFP506A 80
100x80
1TFP505A 40
0-403-J
50000-D002-E (0~12)
TO PULVERIZER
1TFP505A 100
0-403-J
MO-0127 (0~4)
FROM FIRE FIGHTING WATER
0-503
1WS509A 50
50000-D002-B (0~12)
TO COAL SILO & PYRITE HOPPER
0-503
LATER
FROM SERVICE WATER
1WS507A 100
1WS509A 25
1WS512
TO ASH HOPPER AREA AT THE ECONOMIZER
1WS511A 25
1WS513
TO ASH HOPPER AREA AT THE FURNACE
2-818-A
LUBE OIL SYSTEM FOR PULVERIZER "A"
LUBE OIL COOLER
REFER TO "1121170D-ME-DW -ME220-P6001-00239"
2-818-B
LUBE OIL SYSTEM FOR PULVERIZER "B"
2-818-C
LUBE OIL SYSTEM FOR PULVERIZER "C"
2-818-D
LUBE OIL SYSTEM FOR PULVERIZER "D"
1WC504A 80
1WC525A 80
100x80
REFER TO "1121170D-ME-DS -ME220-P6001-00165"
PAF"B"
2-811-B
PAF"A"
2-811-A
REFER TO "1121170D-ME-DS -ME220-P6001-00177"
GAS AIR PREHEATER "B"
2-812
GAS AIR PREHEATER "A"
REFER TO "1121170D-ME-DS -ME220-P6001-00161"
FDF"B"
2-810-B
FDF"A"
2-810-A
2-515
M1-0115-4 (E-1)
FROM COOLING WATER SYSTEM
1WC500A 200
2-515
M1-0115-4 (B-2)
TO COOLING WATER SYSTEM
1WC520A 200
1WC507A 100
200x100
1WC521A 100
NOTE
1. MARK S MEANS BOILER MAKER SCOPE OF SUPPLY.
2. MARK [ ] MEANS EQUIPMENT MAKER SCOPE OF SUPPLY.
FOR CONSTRUCTION
D '14.06.11 FOR CONSTRUCTION S.J.KIM K.J.LEE E.R.CHO
C '14.03.27 FOR APPROVAL S.J.KIM K.J.LEE E.R.CHO
B '13.11.05 FOR APPROVAL S.J.KIM K.J.LEE E.R.CHO
A '13.06.21 FOR APPROVAL S.J.KIM K.J.LEE E.R.CHO
B '13.02.08 FOR APPROVAL S.J.KIM K.J.LEE E.R.CHO
A '12.12.14 FOR APPROVAL S.J.KIM K.J.LEE E.R.CHO
B '12.08.31 FOR APPROVAL K.H.HA K.J.LEE E.R.CHO
A '12.04.30 FOR APPROVAL K.H.HA K.J.LEE H.D.LEE
NO. DATE REVISION DESCRIPTION DRAWN CHK'D APP'D
OWNER Minera Panamá Minera Panama S.A
CONTRACTOR SK E&C SK Engineering & Construction Co. Ltd.,
CONTRACTOR'S ENGINEER Sargent & Lundy
VENDOR Hansol SeenTec SeenTec Co., Ltd.
TITLE P & ID OF COOLING & SERVICE WATER
SCALE NONE
SEENTEC PJT NO. 6F11-1272
WORK NAME PACO POWER PLANT PROJECT (150MW x 2UNITS)
SKEC JOB NO. 11217D
CONTRACTOR DOC NO. 11217D-ME-DG-ME220-P6001-00094
DRAWN S.J.KIM '14.06.11
CHECKED K.J.LEE '14.06.11
APPROVED E.R.CHO '14.06.11
SEENTEC DOC NO. 50000-D008
REV. D
A3(420x297%)




## TEMP. & VIBRATION MEASURING FOR F.D.FAN & P.A FAN

| DESCRIPTION | FAN BEARING TEMPERATURE | | MOTOR BEARING TEMPERATURE | | MOTOR WINDING TEMP | | | | | | MOTOR BEARING VIBRATION | | FAN BEARING VIBRATION | | | | FAN SPEED |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOGIC LOOP | ABC | | ABC | ABC | ABC | | | | (SPARE) | ABC | VMS | VMS | VMS | | VMS | | VMS |
| FDF "A" | 1TE BA570A | 1TE BA570B | 1TE BA571A | 1TE BA571B | 1TE BA572A | 1TE BA572B | 1TE BA572C | 1TE BA573A | 1TE BA573B | 1TE BA573C | 1VE BA570A | 1VE BA570B | 1VE BA571A | 1VE BA571B | 1VE BA572A | 1VE BA572B | 1ST BA570 |
| FDF "B" | 1TE BA580A | 1TE BA580B | 1TE BA581A | 1TE BA581B | 1TE BA582A | 1TE BA582B | 1TE BA582C | 1TE BA583A | 1TE BA583B | 1TE BA583C | 1VE BA580A | 1VE BA580B | 1VE BA581A | 1VE BA581B | 1VE BA582A | 1VE BA582B | 1ST BA580 |
| PAF "A" | 1TE BY590A | 1TE BY590B | 1TE BY591A | 1TE BY591B | 1TE BY592A | 1TE BY592B | 1TE BY592C | 1TE BY593A | 1TE BY593B | 1TE BY593C | 1VE BY590A | 1VE BY590B | 1VE BY591A | 1VE BY591B | 1VE BY592A | 1VE BY592B | 1ST BY590 |
| PAF "B" | 1TE BY600A | 1TE BY600B | 1TE BY601A | 1TE BY601B | 1TE BY602A | 1TE BY602B | 1TE BY602C | 1TE BY603A | 1TE BY603B | 1TE BY603C | 1VE BY600A | 1VE BY600B | 1VE BY601A | 1VE BY601B | 1VE BY602A | 1VE BY602B | 1ST BY600 |
| LOCATION | DE | NDE | IB | OB | U | V | W | U | V | W | IB | OB | X | Y | X | Y | DE |
| | | | | | | | | | | | | | DE | | NDE | | |

NOTE

1. MARK: S>S> MEANS BOILER MAKER SCOPE OF SUPPLY.

2. EQUIPMENT DATA

1BA500CA,B
F.D.FAN

TYPE : CENTRIFUCAL
CAPACITY : 4154.98 $M^3$/MIN
POWER : 510 KW
TOTAL PRESSURE : 495 mmAg
MATERIAL : SS400
SPEED : 1788 RPM

1BY500CA,B
P.A.FAN

TYPE : CENTRIFUCAL
CAPACITY : 1588.72 $M^3$/MIN
POWER : 590 KW
TOTAL PRESSURE : 1335 mmAg
MATERIAL : SS400
SPEED : 1791 RPM

**FOR CONSTRUCTION**

| NO. | DATE | REVISION DESCRIPTION | DRAWN | CHK'D | APP'D |
|---|---|---|---|---|---|
| 0 | '14.06.11 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '14.03.27 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 1 | '13.11.05 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| B | '13.06.21 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '13.02.08 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| A | '12.12.14 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| B | '12.08.31 | FOR APPROVAL | K.H.HA | K.J.LEE | E.R.CHO |
| A | '12.04.30 | FOR APPROVAL | K.H.HA | K.J.LEE | H.D.LEE |

OWNER: Minera Panamá — Minera Panama S.A

CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,

CONTRACTOR'S ENGINEER: S&L — Sargent & Lundy

VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

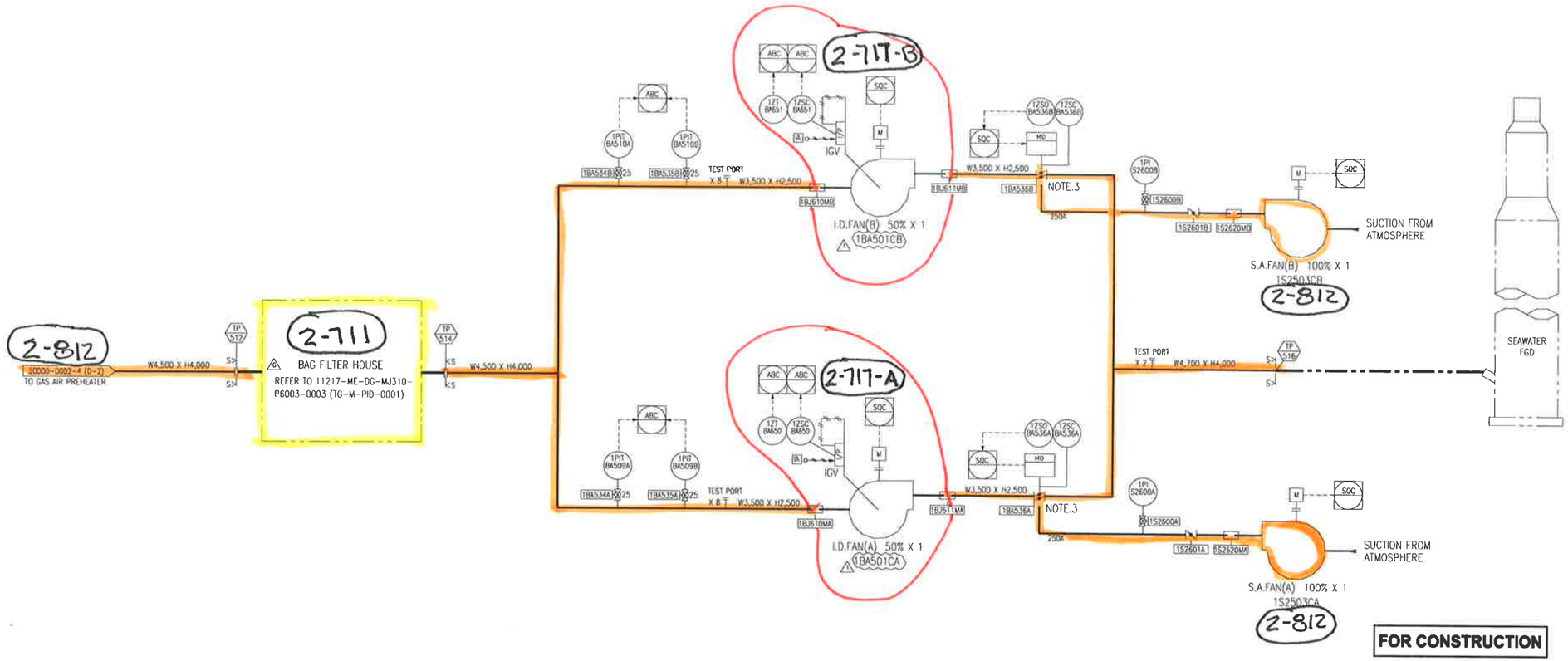
| TITLE | SCALE |
|---|---|
| P & ID OF AIR & GAS SYSTEM (1/7) (PRIMARY AIR & SECONDARY AIR) | NONE |

| SEENTEC PJT NO. | WORK NAME | SKEC JOB NO. |
|---|---|---|
| 6F11-1272 | PACO POWER PLANT PROJECT (150MW x 2UNITS) | 11217D |

CONTRACTOR DOC. NO.: 11217D-ME-DG-ME220-P6001-00088-1

| DRAWN | CHECKED | APPROVED | SEENTEC DOC. NO. | REV. |
|---|---|---|---|---|
| S.J.KIM | K.J.LEE | E.R.CHO | 50000-D002-1 | 0 |
| '14.06.11 | '14.06.11 | '14.06.11 | | |

A3(420x297%)




TEMP. & VIBRATION MEASURING FOR I.D.FAN

| DESCRIPTION | FAN BEARING TEMPERATURE | MOTOR BEARING TEMPERATURE | MOTOR WINDING TEMP. | MOTOR BEARING VIBRATION | FAN BEARING VIBRATION | FAN SPEED |
|---|---|---|---|---|---|---|
| LOGIC LOOP | ABC | ABC ABC | ABC ABC (SPARE) | VMS VMS | VMS VMS | VMS |
| IDF "A" | 1TE BA610A, 1TE BA610B | 1TE BA611A, 1TE BA611B | 1TE BA612A, 1TE BA612B, 1TE BA612C, 1TE BA613A, 1TE BA613B, 1TE BA613C | 1VE BA610A, 1VE BA610B | 1VE BA611A, 1VE BA611B, 1VE BA612A, 1VE BA612B | 1ST BA610 |
| IDF "B" | 1TE BA620A, 1TE BA620B | 1TE BA621A, 1TE BA621B | 1TE BA622A, 1TE BA622B, 1TE BA622C, 1TE BA623A, 1TE BA623B, 1TE BA623C | 1VE BA620A, 1VE BA620B | 1VE BA621A, 1VE BA621B, 1VE BA622A, 1VE BA622B | 1ST BA620 |
| LOCATION | DE NDE | IB OB | U V W U V W | IB OB | X Y X Y (DE / NDE) | DE |

NOTE

1. MARK: S>| |<S MEANS BOILER MAKER SCOPE OF SUPPLY
2. SEAL AIR FANS SHALL BE PROVIDED BY DAMPER MAKER. REFER TO DRAWING 11217D-ME-PR-ME220-P6001-0015B (4DPD1-V102)
3. THESE DAMPERS SHALL BE SUPPLIED AS TANDEM DAMPER WITH 1 X 100% SEAL AIR FANS. THE TANDEM ISOLATION DAMPERS SHALL HAVE ESSENTIALLY ZERO LEAKAGE ACROSS CLOSED BLADES FOR ALL LOAD CONDITIONS. LEAKAGE TO ATMOSPHERE SHALL BE ESSENTIALLY NOTHING IN BOTH OPEN AND CLOSED POSITIONS.
4. EQUIPMENT DATA

1BA501CA,B I.D.FAN
TYPE : CENTRIFUGAL
CAPACITY : 8397.1 M3/MIN
POWER : 2300 KW
TOTAL PRESSURE : 1120 mmAg
MATERIAL : SS400
SPEED : 893 RPM

1S2503CA,B S.A.FAN
TYPE : CENTRIFUGAL
CAPACITY : 50 M3/MIN
POWER : 11 KW
TOTAL PRESSURE : 630 mmAg
MATERIAL : SS400
SPEED : 3535 RPM

**FOR CONSTRUCTION**

| NO. | DATE | REVISION DESCRIPTION | DRAWN | CHD | APP'D |
|---|---|---|---|---|---|
| 7 | '14.10.31 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| 6 | '14.06.11 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| 5 | '14.03.27 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 4 | '14.01.22 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 3 | '13.06.21 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 2 | '13.02.08 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 1 | '12.12.14 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 0 | '12.08.31 | FOR APPROVAL | K.H.HA | K.J.LEE | E.R.CHO |
| A | '12.04.30 | FOR APPROVAL | K.H.HA | K.J.LEE | H.D.LEE |

OWNER: Minera Panamá — Minera Panama S.A
CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,
CONTRACTOR'S ENGINEER: SL — Sargent & Lundy
VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

| | |
|---|---|
| TITLE | P & ID OF AIR & GAS SYSTEM (7/7) (FLUE GAS) |
| SCALE | NONE |
| SEENTEC PJT NO. | 6F11-1272 |
| WORK NAME | PACO POWER PLANT PROJECT (150MW x 2UNITS) |
| SKEC JOB NO. | 11217D |
| CONTRACTOR DOC. NO. | 11217D-ME-DG-ME220-P6001-00088-7 |

| DRAWN | CHECKED | APPROVED | SEENTEC DOC. NO. | REV |
|---|---|---|---|---|
| S.J.KIM '14.10.31 | K.J.LEE '14.10.31 | E.R.CHO '14.10.31 | 50000-D002-7 | 1 |

A3(420x297)

REFER TO "1121700-ME-DS -ME220-P6001-00163"

2-515
M1-0115-4 (B-7)
FROM COOLING WATER SYSTEM
1WC540A 25
IDF"B"
2-717-B
1WC541A 25
M1-0115-4 (B-6)
FROM COOLING WATER SYSTEM
2-515

2-515
M1-0115-4 (A-7)
FROM COOLING WATER SYSTEM
1WC542A 25
IDF"A"
2-717-A
1WC543A 25
M1-0115-4 (A-6)
FROM COOLING WATER SYSTEM
2-515

AIR
GAS
FIRE FIGHTING WTR.
WATER WASHING WTR.
GAS AIR PREHEATER "A" 1BA501AA
1WS504 20
1WS505
1WS510A
1WS510A 65
1WS502 20
1WS503
1WS510B
1WS502A 65
1TFP506A 80
100x80
1TFP505A 40
0-403-J
50000-D002-E (0-12)
TO PULVERIZER
1TFP505A 100
MO-0127 (0-4)
FROM FIRE FIGHTING WATER
0-403-J
GAS AIR PREHEATER "B" 1BA501AB
1WS501 20
1WS514
100x65
25
1WS500A 50
50000-D002-B (0-12)
TO COAL SILO & PYRITE HOPPER
0-503
1WS507A 100
LATER
FROM SERVICE WATER
0-503
1WS509A 25
1WS512
TO ASH HOPPER AREA AT THE ECONOMIZER
1WS511A 25
1WS513
TO ASH HOPPER AREA AT THE FURNACE

2-818-A
LUBE OIL SYSTEM FOR PULVERIZER "A"
LUBE OIL COOLER
1FI WC511A
REFER TO "1121700-ME-DW -ME220-P6001-00239"
1WC509A 40
1WC525A 40

2-818-B
LUBE OIL SYSTEM FOR PULVERIZER "B"
LUBE OIL COOLER
1FI WC511B
REFER TO "1121700-ME-DW -ME220-P6001-00239"
1WC509B 40
1WC526A 40

2-818-C
LUBE OIL SYSTEM FOR PULVERIZER "C"
LUBE OIL COOLER
1FI WC511C
REFER TO "1121700-ME-DW -ME220-P6001-00239"
1WC525B 40
1WC526B 40

2-818-D
LUBE OIL SYSTEM FOR PULVERIZER "D"
LUBE OIL COOLER
1FI WC511D
REFER TO "1121700-ME-DW -ME220-P6001-00239"
1WC526A 40
1WC527A 40

100x80
1WC504A 80
1WC525A 80

REFER TO "1121700-ME-DS -ME220-P6001-00165"
PAF"B"
2-811-B
1WC506A
1WC506B
1WC521B
1WC509A 25
1WC510A 25
1WC530A 25
PAF"A"
2-811-A
1WC502A
1WC502B
1WC521A
1WC509B 40
1WC526B 40
1WC501A 100
1WC522A 100
1WC507A 100
200x100

REFER TO "1121700-ME-DS -ME220-P6001-00177"
1TI WC503
1TEW WC503
DCS
1FS WC507
GAS AIR PREHEATER "B"
2-812
1TI WC502
1TEW WC502
1FS WC503
GAS AIR PREHEATER "A"
1WC529A 20
1WC531A 20
1WC511A 40
1WC533A 40

REFER TO "1121700-ME-DS -ME220-P6001-00161"
FDF"B"
2-810-B
1WC505A
1WC505B
1WC522B
1WC530A 25
1WC530B 25
1WC532A 25
FDF"A"
2-810-A
1WC501A
1WC501B
1WC521B
1WC532B 25
1WC532A 25
1WC514A 40
1WC514A 25
1WC532A 75
1WC532A 40
1WC509B 40
1WC526B 40
1WC507A 100
200x100
H80

ABC
1TE WC500
1TEW WC500
1PI WC500
2-515
TP 527
M1-0115-4 (E-1)
FROM COOLING WATER SYSTEM
1WC501 20
1WC500
1WC500A 200

ABC
1TE WC501
1TEW WC501
1PI WC501
2-515
TP 528
M1-0115-4 (B-2)
TO COOLING WATER SYSTEM
1WC523 20
1WC520
1WC520A 200
200x100
1WC521A 100

NOTE

1. MARK: S / S MEANS BOILER MAKER SCOPE OF SUPPLY.
2. MARK [ _ ] MEANS EQUIPMENT MAKER SCOPE OF SUPPLY.

**FOR CONSTRUCTION**

| NO. | DATE | REVISION DESCRIPTION | DRAWN | CHK'D | APP'D |
|---|---|---|---|---|---|
| 6 | '14.06.11 | FOR CONSTRUCTION | S.J.KIM | K.J.LEE | E.R.CHO |
| 5 | '14.03.27 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 4 | '13.11.05 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 3 | '13.06.21 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 2 | '13.02.08 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| 1 | '12.12.14 | FOR APPROVAL | S.J.KIM | K.J.LEE | E.R.CHO |
| B | '12.08.31 | FOR APPROVAL | K.H.HA | K.J.LEE | E.R.CHO |
| A | '12.04.30 | FOR APPROVAL | K.H.HA | K.J.LEE | H.D.LEE |

OWNER: Minera Panamá — Minera Panama S.A
CONTRACTOR: SK E&C — SK Engineering & Construction Co. Ltd.,
CONTRACTOR'S ENGINEER: S&L — Sargent & Lundy
VENDOR: Hansol SeenTec — SeenTec Co., Ltd.

TITLE: P & ID OF COOLING & SERVICE WATER
SCALE: NONE

| SEENTEC PJT NO. | WORK NAME | SKEC JOB NO. |
|---|---|---|
| 6F11-1272 | PACO POWER PLANT PROJECT (150MW x 2UNITS) | 11217D |

CONTRACTOR DOC NO.: 11217D-ME-DG-ME220-P6001-00094

| DRAWN | CHECKED | APPROVED | SEENTEC DOC NO. | REV. |
|---|---|---|---|---|
| S.J.KIM | K.J.LEE | E.R.CHO | 50000-D008 | 6 |
| '14.06.11 | '14.06.11 | '14.06.11 | | |

A3(420x297%)